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January, 1967

Dear Member:

One year ago, when the Editors of The Library of Computer and Information Sciences offered Ivan Flores' book, COMPUTER SOFTWARE, to its members, the response was overwhelming. Therefore, it is with considerable pleasure that we announce that this month's Main Selection will be the companion volume to this extremely well-received book:

COMPUTER PROGRAMMING

by Ivan Flores

This newly published volume is a systematic examination of the entire field of programming and programming systems. The chief advantage of this work lies in the fact that it does not attempt to explain how to program a specific machine, but rather how the computer, the program and the programming systems operate to solve problems.

Many books explain how to program a specific computer in its own machine language. Some explain how to use special program languages, such as FORTRAN, ALGOL and COBOL, which are almost independent of the computers with which they are used. COMPUTER PROGRAMMING is a comprehensive overview of programming that examines the principles of program writing. It introduces the reader to computer-aided programming and programming systems (also known as "software").

Dr. Flores begins with a marvelously lucid presentation of the computer. We see the computer, not as a machine, but rather as a group of compatible subsystems comprised of such components as the input unit, the computer memory, the processor, the control unit, and the output unit.

Machine language is introduced early in COMPUTER PROGRAMMING in a primitive absolute assembly form called FLAP (from FLores Assembly Program). This is related to the specifications for a hypothetical device--a typical computer referred to as "FLAPJAC." The chief advantage of Dr. Flores' system is that the reader is enabled to write programs in a language closely resembling machine language, but with the added advantage of using mnemonics

(continued on back page)

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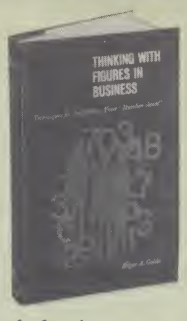

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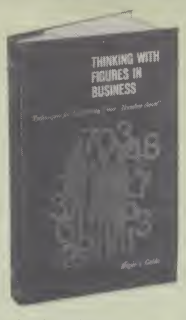

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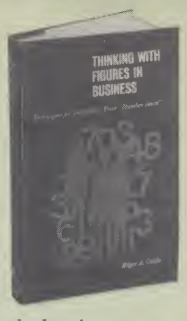

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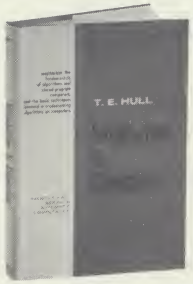

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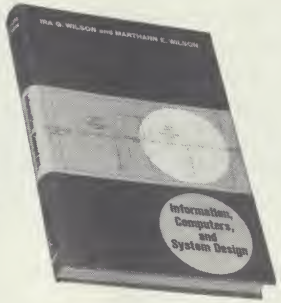

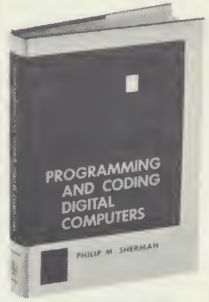

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For members who may have missed this book, it is available this month as an Encore Selection of The Library of Computer and Information Sciences.

Contents

CHAPTER ONE—INTRODUCTION
Software. Plan of the Book. Tutorial System.

CHAPTER TWO—FUNDAMENTALS
Computer Subsystems. Control and Commands. Processor Commands. Reflexive Actions. Indexing. Addressing. IO Commands.

CHAPTER THREE—PROGRAMMING CONCEPTS
Subroutines. Loops. Other Loop Considerations. Data Organization. Lists. Linked List. Buffers. Buffer Pool Management.

CHAPTER FOUR—SOFTWARE INTRODUCED
Translators. Interpreters. Other Software.

CHAPTER FIVE—ASSEMBLY
The Assembler. What's to be done? Pseudos. First Pass. Analysis Phase. Windup of First Pass. Second Pass. The One-Pass Assembler.

CHAPTER SIX—MACROCOMMANDS
What are Macros? FLAP Macro Definition. A Fixed Macrogenerator—QUAD. A Universal Generator for Fixed Macros. Macro Definition Tables. Nested Macros.

CHAPTER SEVEN—ASSEMBLER SUBROUTINES
More on Subroutines. Calling Library Subroutines. Assembling Subroutines. Subroutine Errors.

CHAPTER EIGHT—ASSEMBLER REFINEMENT
Repetition Commands. Processing Within Assembly. Output Listing, Modification. Segmentation and Overlay. Data Definition. Miscellaneous. Summary.

CHAPTER NINE—IOCS—PREPROCESSOR, BUFFER SUBSYSTEM
Orientation. Activity Accounting. Preprocessor Description. Preprocessor Operation. Buffer and File Allocation. Buffer Definition Routines. Attach and Open. Closing Files.

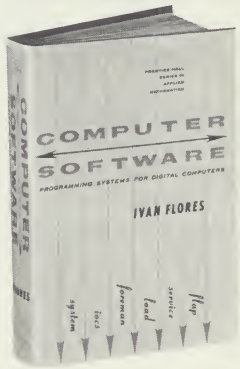
CHAPTER TEN—IOCS OPERATING COMMANDS
Command and Subcommands. More About Commands. Complete Example. Read/Write Activity. Read/Write Command Setup. Analysis and Completion. RW Subcommand. Release, Unbuffer, Get Full Buffer. Other Commands. Variable-Length Records.

CHAPTER ELEVEN—THE FOREMAN
Introduction. The Trap Routine. Errors and Exceptions. Print (or Punch). Halts and Errors. Discontinue, Internal Dispatcher, Initiate. Initiate-associated Routines. Nondata. Attention Requests; Noninterrupt.

CHAPTER TWELVE—SERVICE SYSTEMS
Introduction. Copy. Finding. Single-block Edit—S/Edit. Multirecord Editor. Program for Editor. Variable Record Length. Conversion; Service Systems.

CHAPTER THIRTEEN—SUPERVISORS
The Supervisor and the Job. The Contents of SYSTEM. Preprocessor; Unit Allocation. The System Library. Interplay of SYSTEM and SUBSYSTEM. Cold Start; Rejuvenation.

CHAPTER FOURTEEN—THE LOADER AND ALLOCATOR—LOAD
The Loader. Sequence of Operations. Program Loading. Subroutine Loading. Finale.



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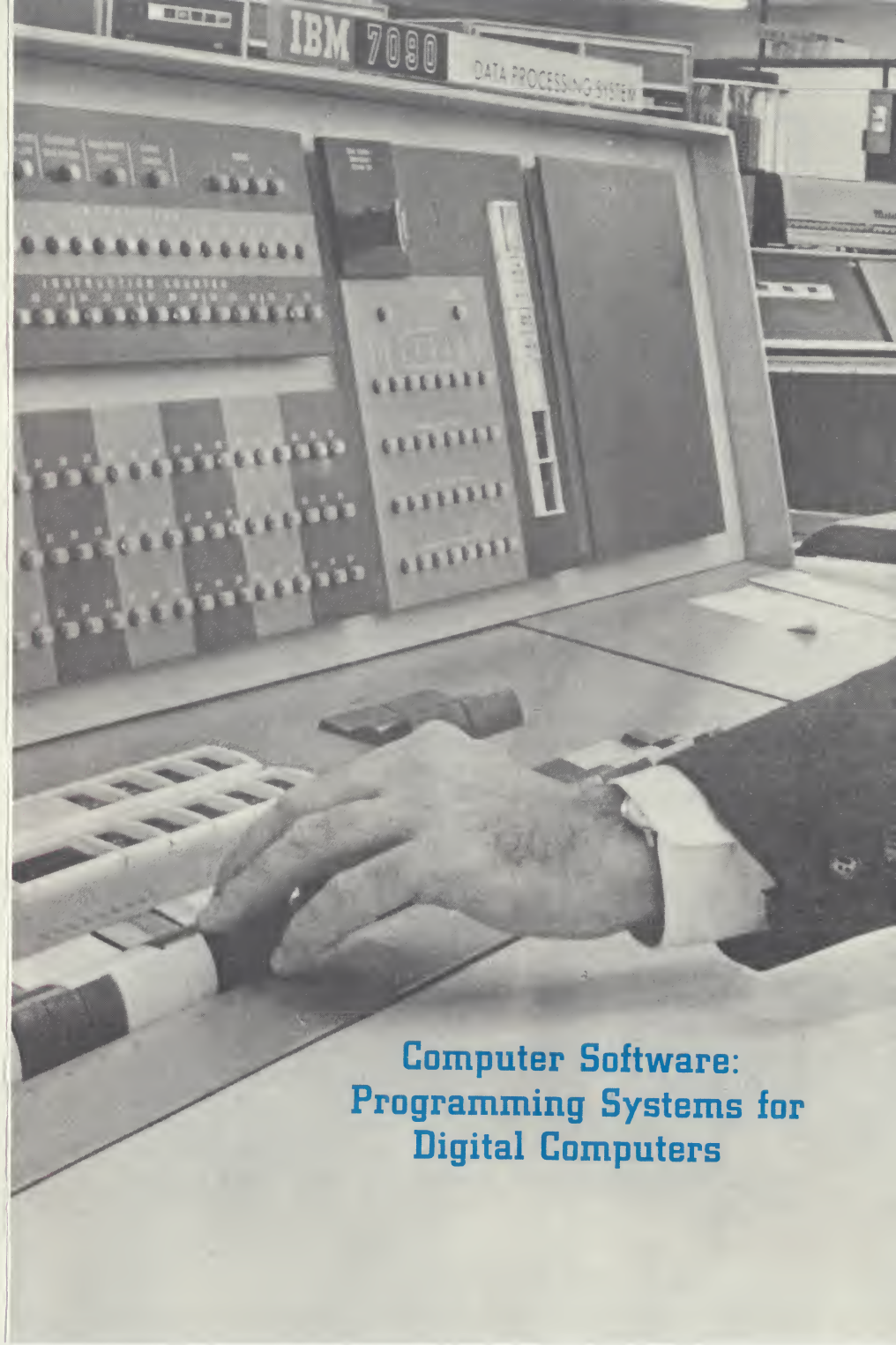

Computer Software: Programming Systems for Digital Computers

Computer programming is much more than just an intensely practical art. Today, the burgeoning computer "software" industry (the programs and routines that implement and extend the remarkable capabilites of computers) is challenging computer "hardware" in terms of sheer size and innovations.

In the simplest sense, a program is nothing more than a plan for the computer solution of a problem. "Software" describes those programs whose purpose is *not* to solve a given problem or to operate an accounting system, but which *facilitate the use of the computer* in one of these operations.

As anyone who has ever been exposed to computer operations knows, the acquisition of an automatic digital computer does not mean that all problems are on the way to solution the moment the computer is set up and is put to work; often the software provided by the computer manufacturer to keep the computer operating efficiently is inadequate for the problem. The user must then produce his own, designed for his own special needs and problems.

COMPUTER SOFTWARE: Programming Systems for Digital Computers, by Ivan Flores, is an unusually practical and fact-filled handbook of the growing techniques and applications of computer software. Specifically designed for programmers who want to know more about computer software, Dr. Flores' book can be read and used profitably by anyone with a basic knowledge of programming and even the briefest acquaintanceship with or access to computers.

Dr. Flores' just-published book begins with a basic review of the fundamental structure of the computer and its subsystems and explores indexing and the various methods of addressing computers. With a brief but solid foundation in computer fundamentals established, Dr. Flores then turns his attention to a comprehensive presentation of programming concepts. He reviews for the reader the principles of the construction of subroutines (a generalized sequence of instructions designed to perform a particular function when provided with specific problem data) and loops (the repetition of a sequence of instruction) and devises the highly utilitarian linkage and calling-system conventions which are a feature of the book.

Lists are important to all branches of programming. In COMPUTER SOFTWARE: Programming Systems for Digital Computers, Dr. Flores has developed a unique symbology for presenting list concepts. Because buffering (isolating circuits) is unavoidable in large computers with simultaneous IO (Input-Output) device operation, the author discusses various systems leading up to the buffer pool, the most advanced concept required for a complete Input-Output Control System (IOCS).

It has been estimated that 99% of translation for computer operation uses assemblers (a program equipping a computer to accept instructions in other than machine language) and that more than 20% of average computer time is spent in translation. In his treatment of this highly important function, the author describes and analyzes systems ranging from the simplest to the most complete. Mnemonics are the kernel of any assembly language: the author uses the acronym FLAP (for Flores Assembly Program) to describe his system, which furnishes the various types of assembly commands used in the accompanying exercises—an important feature of the book.

Dr. Flores also describes a hypothetical automatic computer (FLAPJAC) with the addressing and indexing characteristics for his assembly language. This computer uses a 36-bit word—a convenient size for both alphabetic and numeric information.

The author of COMPUTER SOFTWARE: Programming Systems for Digital Computers is uniquely qualified for his task. A consultant in computer design and associate professor of electrical engineering at Stevens Institute of Technology. Dr. Flores has served as an advisor to manufacturers whose products range from small, special-purpose devices to large general-purpose computers. He is also the author of *The Logic of Computer Arithmetic* and *Computer Logic: The Functional Design of Digital Computers*.

Without computer "software" to complement and extend its problem-solving procedures, computer "hardware" can only stand mute and lifeless—and economically wasteful. This comprehensive review of programs and routines is an extremely useful book that may well be regarded as a classic in its field for many years to come.